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(71) Applicant (for all designated States except US): **UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC.** [US/US]; 223 Grinter Hall, Gainesville, FL 32611 (US).

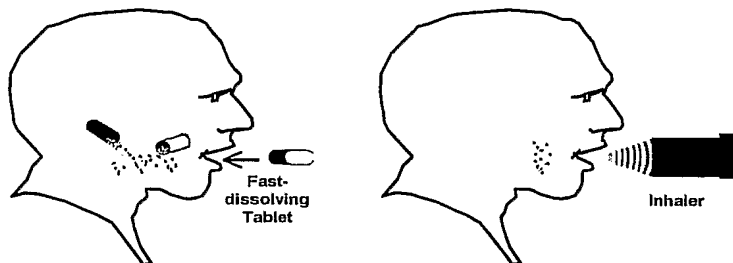
(72) Inventors; and

(75) Inventors/Applicants (for US only): **MELKER, Richard, J.** [US/US]; 6101 NW 19th Place, Gainesville, FL 32605 (US). **SACKELLARES, James, Chris** [US/US]; 9841 S.W. 55th Rd., Gainesville, FL 32608 (US). **GOLD, Mark, S.** [US/US]; 5745 S.W. 75th St.

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR REAL-TIME DIAGNOSIS, TREATMENT, AND THERAPEUTIC DRUG MONITORING

Patient Compliance Monitoring System Step 1 - Medication is taken, releasing Marker Compound



Marker compound is released by dosage form for detection

(57) **Abstract:** Systems and methods for diagnosing and/or treating diseases as well as monitoring disease treatment. For diagnosis, the present invention uses nanoparticle-based assemblies, which comprise a nanoparticle; a surrogate marker; and a means for detecting a specific chemical entity. In certain embodiments, nanoparticle-based assemblies include a payload for simultaneous diagnosis and treatment of disease. In further embodiments, a therapeutic drug and therapeutic drug marker are administered to a patient to monitor disease treatment. Bodily fluid samples are analyzed using sensor technology to detect the presence of surrogate and/or therapeutic drug markers to provide an efficient and accurate means for diagnosing a disease and/or monitoring disease treatment.



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#324, Gainesville, FL 32608 (US). **DENNIS, Donn, Michael** [US/US]; 4949 SW 95th Terrace, Gainesville, FL 32608-4189 (US).

(74) **Agents: EFRON, Margaret** et al.; Saliwanchik, Lloyd & Saliwanchik, P.O. Box 142950, Gainesville, FL 32614-2950 (US).

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